

# Metropolis revisited: the evolving role of librarians in informatics education for the health professions

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**Objective:** The authors' goal was to assess changes in the role of librarians in informatics education from 2004 to 2013. This is a follow-up to "Metropolis Redux: The Unique Importance of Library Skills in Informatics," a 2004 survey of informatics programs.

**Methods:** An electronic survey was conducted in January 2013 and sent to librarians via the MEDLIB-L email discussion list, the library section of the American Association of Colleges of Pharmacy, the Medical Informatics Section of the Medical Library Association, the Information Technology Interest Group of the Association of College and Research Libraries/New England Region, and various library directors across the country.

**Results:** Librarians from fifty-five institutions responded to the survey. Of these respondents,

thirty-four included librarians in nonlibrary aspects of informatics training. Fifteen institutions have librarians participating in leadership positions in their informatics programs. Compared to the earlier survey, the role of librarians has evolved.

**Conclusions:** Librarians possess skills that enable them to participate in informatics programs beyond a narrow library focus. Librarians currently perform significant leadership roles in informatics education. There are opportunities for librarian interdisciplinary collaboration in informatics programs.

**Implications:** Informatics is much more than the study of technology. The information skills that librarians bring to the table enrich and broaden the study of informatics in addition to adding value to the library profession itself.

## INTRODUCTION

### Objective

In 2004, the authors reported on the participation of librarians in informatics programs [1]. Information was obtained from a survey of twenty-six informatics programs in hospital systems, research organizations, and universities. The results indicated that library skills formed an important part of the curriculum of many of the surveyed programs. We further concluded that librarians have a unique combination of technological and human skills that provide excellent opportunities for interdisciplinary collaboration, especially in informatics.

The objective of this paper is to provide a ten-year follow up that investigates the evolving role of librarians in informatics education. This second survey focuses on librarian involvement, including in leadership roles, in programs that train health professionals in informatics skills.

### The ever-changing environment

Since the advent of informatics as a discipline, coming into its own during the 1970s, the definition of the field has evolved. Initially, informatics was viewed as being essentially centered on computer technology, the tools of working with information, rather than information itself. This view was reflected by Haux in 1997 as "the discipline concerned with the systematic

processing of data, information and knowledge in medicine and health care" [2]. The Medical Library Association's own Medical Informatics Section still defines the field in a similar way: "Although definitions vary, medical informatics focuses on broad-based computer applications involved in the transfer of information for health care and for the education, research, and administration that support it" [3].

However, new ideas on the nature of informatics are emerging, including the role of librarians. These definitions focus on the nature of "information itself," rather than being exclusively assigned to the technology used to access it.

We define health care informatics as the study of how the diverse types of health information are researched and combined to result in decisions to optimize patient care quality. Just a few examples of these diverse types of information include knowledge (including library) resources, patient records, diagnostic radiology and laboratory reports, professional communications, and decision processes. Appendix A (online only) provides a graphic view of our vision of informatics.

The observation that informatics extends beyond the consideration of technology has been documented in the literature. In 1995, Perry argued for a broader definition of informatics in response to the expansion of the role of librarianship in health care [4]. Reflecting this view in a 1998 article, Stead offered this insight on informatics: "the science that deals with health information, its structure, acquisition, and use. The interaction of human being and machine may stay...But it will be easier to tackle with an information infrastructure based on universal truths"



Supplemental Appendix A and Appendix B are available with the online version of this journal.

[5]. Technology is included in so far as it is used to access this information. For example, it includes the technologies for disease diagnosis and telemedicine communications. However, the field of “informatics,” in our view, is more than technology and includes elements independent of specific technologies. This definition indicates librarians, as professionals focused on the utilization of “information” itself, are well placed for a leadership role in informatics. It is not a coincidence, for example, that the National Library of Medicine has taken the initiative during the last decade in developing informatics instructional programs. Such leadership is a natural fit for the librarian skill set.

In “*Metropolis Redux: The Unique Importance of Library Skills in Informatics*,” we identified a set of basic interdisciplinary information skills [1]: (1) effectively sorting through the volume of available information by utilizing research skills, (2) evaluating information based on the specific clinical or health care need, and (3) transforming that information into productive results (via a presentation or decision). In addition, we presented an argument that librarian-specific skills are included in the field of informatics: “Librarians are specifically trained to research, locate, evaluate, and present information. Because these skills are not technology dependent, they are enduring” [1]. In fact, by providing greater access to a larger volume of information, technology has increased the value of choice and precision in researching: “Teaching a student the most effective way of performing a search in MEDLINE is an enhanced skill beyond demonstrating the ‘technical skills’ of operating the MEDLINE interface” [1].

During the past decade, informatics understanding has evolved, making the argument for librarian participation more compelling. Blumenthal outlines nursing profession informatics competencies in both the preclinical and clinical areas. Many of these competencies focus on information literacy skills, a side of informatics with intense librarian involvement [6]. The professions are beginning to view informatics as more than a conglomeration of computer technologies, but rather, the utilization of information itself. This requires an evolution in thinking beyond one’s own profession. Part of this evolution has been the increase in participation in informatics among a variety of the health professions.

### Health informaticist versus health sciences librarian

The emergence of the *health informaticist* is a case in point and could be viewed either as a threat to librarianship or an opportunity for greater library participation. We believe the second position is the more accurate choice. Hersh argued as far back as 2002 that the complexity of health information called for the formation of a new profession [7]. In his view, the health informaticist could come with a library science degree (supplemented by clinical experience) or specific training in medical informatics. As with librarians, health informaticists, as managers of health

data and decision-making tools, do serve a role in supporting evidence-based health care. Murphy, in her 2010 article “Health Science Librarianship’s Legacy to Health Informatics,” identified the relative intensity in informatics-specific activities between the two disciplines [8]. She determined that health informaticists were more intense in the areas of database design, health and patient information databases, and decision system design, while librarians excelled in human interaction as well as education and training. She found that both professions have high intensities of knowledge management, information retrieval, and database design [8].

Davidoff explained the difference between librarians and “informationists” this way: general medical librarians work across specialties, reflecting their reference and human contact role, while “informationists” focus narrowly on specific topics, reflecting their technology orientation [9]. Librarianship and related professions do have strong foundations in information science, a fact that argues for a greater understanding of informatics by health sciences librarians [10].

The ability of librarians to work across disciplines, including informaticists and the health professions, has proved to be a strong influence on the successful teaching of future health practitioners. Specifically, the librarian skill set for the acquisition, access, and retrieval of information enables informaticists to focus on technology design and the health professions on information interpretation and decision making.

This is of noteworthy importance during the current age of increased information access and complexity [11]. Accessing information for health professional education is now essentially an online activity. Librarians’ focus on information retrieval in response to human needs provides them with a vital role in interpreting information technology for professionals and students, from teaching knowledge database research to the utilization of iPad technology for accessing quality information.

Librarians are learning how information is managed in the problem-based learning environment and are teaching students to develop timely information research skills [12]. Problem-based learning activities, as a result, provide more opportunities for interdisciplinary collaboration for librarians with medical and nursing faculty. This is illustrated through a critical thinking-exercise that Phillips and Bonsteel described where librarian-contributed expertise enabled students to apply research directly to individual projects in classroom and computer lab settings, using a variety of data resources. This exercise established a research model for their later real-life experiences [13]. Beyond the actual exercises themselves, the experience taught the students the importance of interdisciplinary collaboration in information research.

In addition, librarians support learning through their embracing iPad, iPhone, and other mobile technology for reference and instruction purposes. Librarian-developed sites recommending apps are common services offered to students at many academic

institutions, an illustration of library instruction beyond the in-person reference encounter or the online classroom itself. By changing how information is managed and used, librarian services increasingly reside in the “virtual” rather than the “physical” world. Hasman put it very nicely by stating, “Technologies are also the key components in moving education from place to space” [14]. The increased use of emerging online technology is leading librarians to explore its nature more closely. Because boundaries are disappearing among different types of information, librarians have the opportunity to participate in the development of systems that combine and integrate library-based (knowledge) information with other types of data [15]. In this role, librarians are able to expand student expertise into a new understanding of how diverse forms of information work together in their disciplines.

As can be seen, the perception of informatics has grown with the evolution of librarianship itself. Core information skills in which librarians specialize should, therefore, facilitate a team leadership role in informatics education. Does this speculation bear out in actual informatics programs? Our survey addresses this question.

## METHODS

An electronic survey was conducted in January 2013 and sent out to librarians via the MEDLIB-L email discussion list, the library section of the American Association of Colleges of Pharmacy, the Medical Informatics Section of the Medical Library Association, the Information Technology Interest Group of the Association of College and Research Libraries, and various library directors across the country (Appendix B, online only).

## RESULTS

### Responding institutions

Fifty-five respondents completed the survey, most of them (48, 87%) from general academic and health center academic institutions. Seven institutions (13%) identified themselves as standalone hospitals or independent academic centers. All 55 institutions provided information literacy training. Forty-three (78%) also offered other types of informatics training. Thirty-six institutions (65%) reported that library and knowledge content was included within the structure of their informatics training.

Forty-six respondents identified the missions of their programs (information literacy and other informatics training). The missions of these informatics programs included: preparing students to function more effectively in their chosen profession (20), providing a general introduction to the field of informatics (9), and providing students with applicable research skills regardless of their eventual career choices (12). Additional missions that respondents identified included: providing library resource access

on mobile devices during rotations, preparing students with search and retrieval skills as well as clinical decision making for medical practice and lifelong learning, demonstrating systems and training trainers, introducing students to core challenges of medical/health informatics, and preparing informatics professionals to perform multiple roles.

The delivery of these courses varied among institutions. Of the 32 respondents to this question, 23 (72%) provided classroom instruction only, 4 (12.5%) online only, and 1 (3%) a hybrid combination of classroom and online. In addition, 4 institutions (12.5%) offered multiple courses that included a variety of delivery methods.

### Librarian involvement

Of the 55 institutions, 30 (55%) provided librarians with faculty status.

Thirty-four institutions (62% of the 55 institutions) included librarians in nonlibrary aspects of informatics training. Samples of the topics where librarians participated included: open web-based information, telemedicine and distance learning, clinical information systems, bioinformatics, decisions and decision making, organizational informatics, public health informatics, mobile devices, and emerging technologies. Additional content areas that responding institutions identified included the history of informatics, correct citation formats, history of information devices and the Internet, evaluation of resources, copyright or information ethics, introduction to research terminologies and ontologies, standards, and journal article evaluation. Some of these areas clearly fell within the bounds of traditional knowledge information, while others reflected groundbreaking library participation.

The 34 institutions with librarian involvement in nonlibrary aspects of informatics instruction were asked the key question of identifying the roles played by librarians. A variety of responses included: a librarian-centered program taught exclusively by librarians (14, 41%), guest speaking by librarians in classes based in other departments (28, 82%), and library support to informatics courses taught by other faculty (9, 26%).

The most intriguing response to the above question, however, came from 15 institutions (44% of the 34) that identified librarians in a leadership or coordination role for an interdisciplinary team for at least 1 course. Sample roles included participating on a team of pharmacists, nurses, and physician assistants; leading a second-year medical student evidence-based medicine team; being the course director of an interdisciplinary evidence-based medicine course; chairing a medical informatics and bioinformatics committee; coordinating a seminar series on ethics for interdisciplinary students; and being the director of a graduate-level certificate program.

### Comparison to 2002

In the 2002 survey for the original paper, 84% of responding informatics programs included library

content. Also, in 75% of the programs, knowledge-based information composed 40% or more of the course content. The librarian focus was clearly on its traditional teaching role. The current survey reveals an expanded librarian role. Although 100% of the programs currently surveyed include information literacy training, librarians are teaching in other areas as well, for instance: emerging technologies, mobile technologies, public health informatics, decision making, open web information, bioinformatics, and clinical information systems. In addition, librarians are expanding their leadership roles in interdisciplinary teams. In the original survey, there were a large number of library-managed informatics programs; however, these programs centered on traditional knowledge resources. The current survey reveals that an increasing number of institutions now have librarians in leadership roles in interdisciplinary informatics teams. This, in our view, is a major advancement for the profession. Online only Appendix B provides more details of the survey.

## DISCUSSION

### Limitations

Because responses were voluntary, those participating were more likely to be involved in informatics programs. Although no claims can be made that the results represent institutions beyond those that responded, they do point to a trend among those that did participate.

Although librarian involvement in informatics education is the focus of this paper, we must remember that, ultimately, education is about the students. As future professionals, when presented with a health care issue, students should be able to identify what the different types of required health information are and how they work together in the care of a patient. In addition, they should acquire core information competencies for researching information and solving problems. For instance, students must be competent utilizing an evidence-based approach to patient care, which includes an ability to conduct an efficient literature search utilizing electronic databases and web resources, as well as evaluating the results and making effective information-based decisions.

## CONCLUSIONS

Based on the survey results, we conclude that:

1. *Some librarians currently play significant leadership roles in interdisciplinary teams in informatics education.* The survey reports that, of the thirty-four institutions where librarians are involved in nonlibrary aspects of informatics training, fifteen described a librarian leadership role in those programs. A broad variety of professions are represented in the interdisciplinary teams they lead.
2. *Librarians have the necessary information skill sets to contribute teaching content beyond a narrow library*

*focus.* The survey provides evidence that, in informatics education, librarians participate in at least fourteen areas beyond resources held in the traditional library. This activity indicates that librarians' information skills provide relevance beyond their traditional roles. Since the original paper was published in 2004, advances in technology (including mobile access to information and increased provision of library services in a virtual environment) have led librarians to expand their skills into these new areas.

3. *There is an opportunity for librarians to grow their contribution to informatics education.* The librarian profession is well placed because its skill set is important to both faculty and students. Since the initial survey in 2002, librarians have expanded their roles in informatics education (as reflected in the second survey). As libraries continue to embrace new technologies and librarians enter more collaborative ventures with other disciplines, one can expect their contribution to informatics education to grow.

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